

# USER'S INFORMATION, MAINTENANCE AND SERVICE MANUAL

## HIGH EFFICIENCY TUBULAR HEAT EXCHANGER SERIES

### MODELS: PS9 / FC9S / FL9S (Single Stage Downflow/Horizontal)



This product was manufactured in a plant whose quality system is certified/registered as being in conformity with ISO 9001.

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#### CONTACT INFORMATION

- Go to website at [www.york.com](http://www.york.com) click on "contact", then click on "contact form" and follow the instructions.
- Contact us by mail:

York International  
Consumer Relations  
5005 York Drive

The manufacturer recommends that the user read all sections of this manual and keep the manual for future reference.

#### WARNING

**FIRE OR EXPLOSION HAZARD** - Failure to follow safety warnings exactly could result in serious injury, death, or property damage.

— **Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.**

— **WHAT TO DO IF YOU SMELL GAS:**

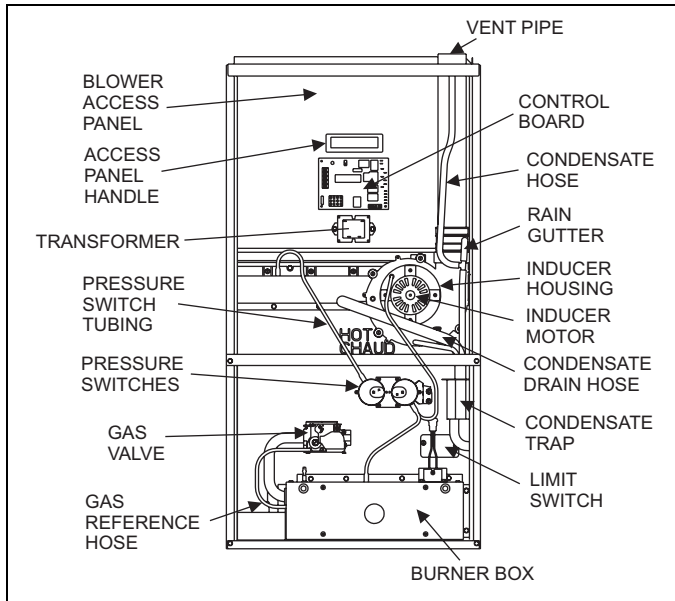
- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone (including cell phone) in your building.
- Leave the building immediately.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

— **Installation and service must be performed by a qualified installer, service agency or the gas supplier.**

## SECTION I: USER'S INFORMATION

### SAFETY

- The furnace area must be kept clear and free of combustible materials, gasoline and other flammable vapors and liquids.
- Insulating materials may be combustible. The furnace must be kept free and clear of insulating materials. The furnace area must be examined when installed in an attic or other insulated space or when insulation is added to be sure that the insulation material has been kept away from the furnace.
- The furnace needs air for combustion in order to operate properly and safely. Do not block or obstruct air openings on the furnace, air openings to the area where the furnace is installed, or spaces around the furnace.
- Follow the instructions exactly as shown on the OPERATING INSTRUCTION LABEL or the Start-up and Shutdown Instructions on Page 3 of this manual when lighting the furnace or turning the furnace off.
- Should the gas supply fail to shut off or if overheating occurs, shut off the gas valve to the furnace before shutting off the electrical supply.
- Do not use this furnace if any part has been under water. A flood-damaged furnace is extremely dangerous. Attempts to use the furnace can result in fire or explosion. A qualified service agency should be contacted to inspect the furnace and replace all gas controls, control system parts, electrical parts that have been wet or the furnace if deemed necessary.

**FIGURE 1:** Component Locations

7. NEVER . . . Store flammable materials of any kind near your furnace. Gasoline, solvents, and other volatile liquids should be stored only in approved containers outside your home. These materials vaporize easily and are extremely dangerous.
8. NEVER . . . Store cleaning materials near your furnace. Materials such as bleaches, detergents, powdered cleansers, etc., can cause corrosion of the heat exchangers.
9. NEVER . . . Use the area around your furnace as a storage area for items which could block the normal flow of air. This flow of air is required for ventilation of the various furnace components.

## ⚠ WARNING

### FIRE OR EXPLOSION HAZARD

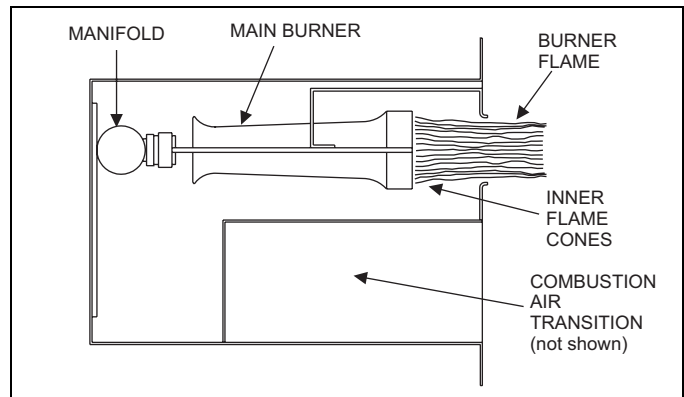
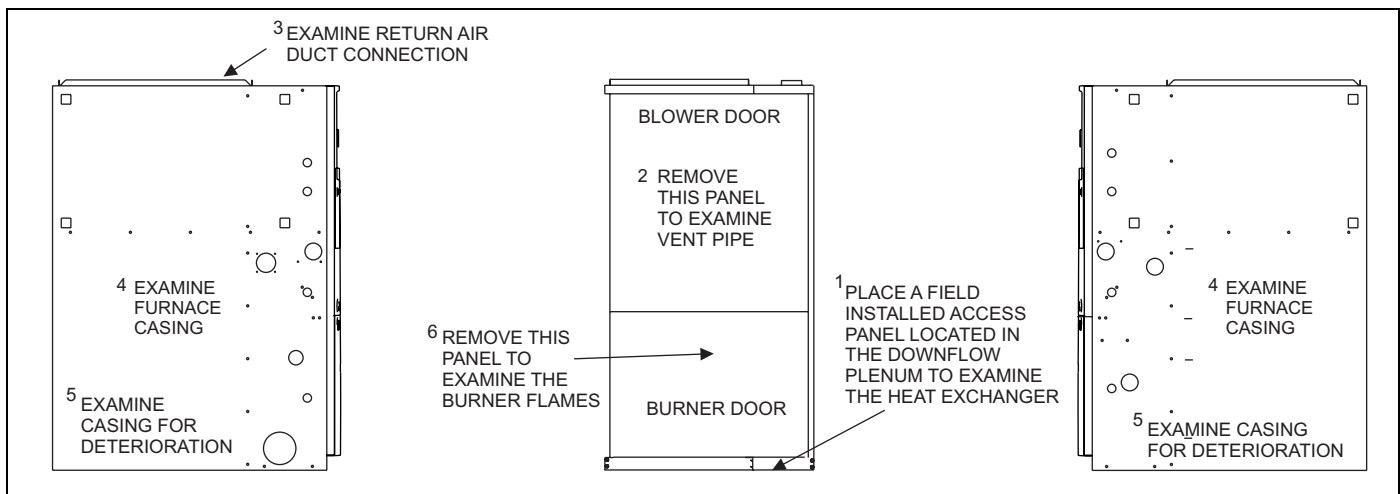
***This furnace is designed and approved for use with Natural Gas and (LP) Propane Gas ONLY. DO NOT BURN ANY LIQUID FUEL OR SOLID FUEL IN THIS FURNACE.***

***Burning any unapproved fuel will result in damage to the furnace heat exchanger, which could result in Fire, Personal Injury, and/or Property Damage.***

## INSTRUCTIONS FOR EXAMINING THE FURNACE INSTALLATION

It is the owner's responsibility to ensure that an annual inspection of the entire heating portion of the unit is made by a qualified service agency.

1. Examine the heat exchanger, through a field installed access panel located on the supply air plenum. Visually examine the exterior sections of the vent/combustion air piping and the vent connectors to be sure that they are physically sound without holes or excessive corrosion.
2. Examine the vent pipe making sure it is firmly in place, that it slopes slightly upward and is physically sound without holes and all of the connections are secure.
3. Examine the return-air duct connections to make sure they are physically sound, sealed to the furnace casing, and the ducts terminate outside the space containing the furnace.
4. Examine the furnace casing making sure the physical support is sound without sagging, cracks or gaps. Examine the furnace base making sure it is physically sound without cracks, gaps or sagging and has a good seal.
5. Examine the furnace casing for obvious signs of deterioration.
6. Examine the burner flames to make sure they are in good adjustment. Refer to the pictorial sketch shown in Figure 2 as a comparison to the actual flame.
7. Examine the furnace as outlined above in steps 1 - 6 before each heating season. Use Figure 3 for visual reference.

**FIGURE 2:** Burner Flame Drawing**FIGURE 3:** Furnace Examination Checkpoints

## HOW YOUR GAS FURNACE WORKS

Your furnace is a very easy appliance to take for granted. Season after season, it sits there in your home, keeping you warm and comfortable. For this reason, you may never have given much thought to the way your furnace operates. In order to get the safest and most efficient operation from your furnace, you should understand how your furnace does its job.

When you set your thermostat to provide more heat in your home, you are starting the heating cycle of the furnace. First, the inducer motor starts to purge the heat exchanger of any remaining gases. Next, the hot surface igniter glows and after a warm-up period the gas valve opens and ignition occurs. A short time later, the blower starts and distributes the warm air throughout the home. When the temperature setting on your thermostat is reached, the gas valve closes, the main burners are turned off, and the blower continues to run until the remaining warm air in the system is distributed. When the blower stops, the heating cycle has ended.

## START-UP AND SHUTDOWN INSTRUCTIONS

**Read the Instructions Below Before Trying to Start the Furnace**

### **WARNING**

***If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury, and/or loss of life.***

- This appliance does not have a pilot. It is equipped with an ignition device which automatically lights the burner. Do not try to light the burner by hand.
- BEFORE OPERATING**; smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.
- Use only your hand to push the gas control switch to the "on" position. Never use tools. If the switch will not operate by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control, which has been under water.

### Operating Instructions:

- STOP! Read the safety information above.
- Set the thermostat to the lowest setting.
- Turn off all electric power to the appliance.
- Remove burner door.
- Move gas control switch to the "OFF" position. Do not force.
- Wait five (5) minutes to clear out any gas. If you then smell gas, STOP! Follow "B" in the safety information above. If you don't smell gas, go to next step.
- Move gas control switch to the "ON" position. Do not force.
- Replace burner door.
- Turn on all electric power to the appliance.
- Set thermostat to the desired setting. Burner will light, which may take 30-60 seconds.
- After three (3) trials for ignition, if the appliance will not operate follow the instructions, "TO TURN OFF THE APPLIANCE" and call your service technician or gas supplier.

### To Turn Off the Appliance:

- Set the thermostat to lowest setting.
- Turn off all electric power to the appliance if service is to be performed.

- Remove burner access panel.
- Move gas control switch to the "OFF" position.
- Replace burner access panel.

### **WARNING**

***Should overheating occur, or the gas valve fail to shut off, turn the external manual gas valve in the gas supply line to the furnace to the "off" position and let the furnace cool off before shutting off the electrical power supply. Refer to Figure 5.***

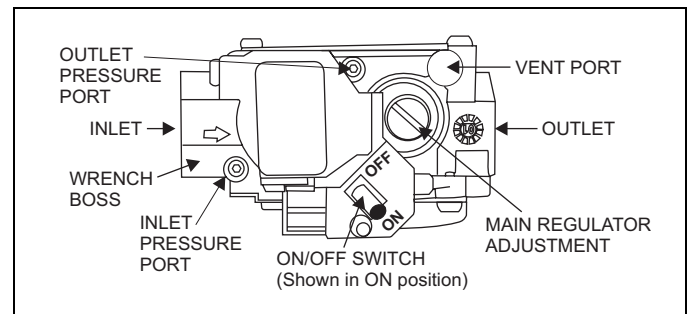


FIGURE 4: Gas Valve - White Rodgers

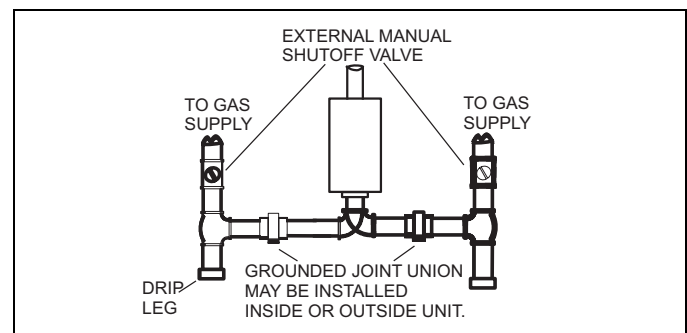


FIGURE 5: Gas Piping

**NOTE:** The spring-loaded safety cut-off switch, mounted on the blower deck, behind the indoor fan access panel will automatically cut off the electrical power supply to the furnace when the blower panel is removed. As a safety precaution, all electrical power and the gas supply to the furnace should be turned off before servicing.

## FURNACE USER MAINTENANCE

### **WARNING**

***Before proceeding, be sure the area is well ventilated. Turn the thermostat OFF. If the blower is running, wait until it stops automatically. Turn OFF the gas and electrical power supplies to the furnace. Check all metal parts and surfaces to be sure they have cooled to room temperature before you begin.***

### Blower Care

Even with good filters properly in place, blower wheels and motors will become dust laden after long months of operation. The entire blower assembly should be inspected annually. If the motor and wheel are heavily coated with dust, they can be brushed and cleaned with a vacuum cleaner. If the blower cannot be properly cleaned without removing it from the furnace, then this service must be performed by a qualified service agency.

The blower can be serviced/removed from the inside blower access panel. In order to facilitate this process the combustion air pipe inside the furnace has a 2" diameter rubber sleeve. The combustion air pipe inside the furnace is a two-pipe combination coupled together with this rubber sleeve. A similar 2" coupling provided loose with the furnace, should be used on top of the furnace to couple the combustion air pipe sticking through the casing top, with the combustion air piping. When the clamps on both of these rubber couplings are loosened, the couplings can be slid up or down the combustion air pipe. This will allow the small combustion air pipe in front of the blower housing to be removed easily. After the combustion air pipe is removed, it is easy to remove the inside blower access panel by pushing it up, against a spring. Blower is now ready to be serviced through the opening.

If the blower has to be removed through the inside blower access panel, then the top flange, blower door switch and bottom flange will also have to be removed.

## WARNING

**Make sure you DO NOT move the clip-on weight on the indoor fan wheel when cleaning the wheel. This weight is used to balance the wheel. Moving the weight will cause the fan wheel to vibrate.**

### Air Filters

The filters should be checked every 3 months. On new construction, check the filters every week for the first four weeks and every three weeks after that, especially if the indoor fan is running continuously. When replacing the filter(s), refer to Table 1 to be sure you install the right size filter for your furnace. Dirty filters greatly restrict the flow of air and may cause damage to the moving parts of the furnace. If the filters become clogged the heat exchangers and blower motor could overheat resulting in a potentially dangerous situation.

Never operate your furnace without a suitable air filter.

Use the following procedure to determine the filter size.

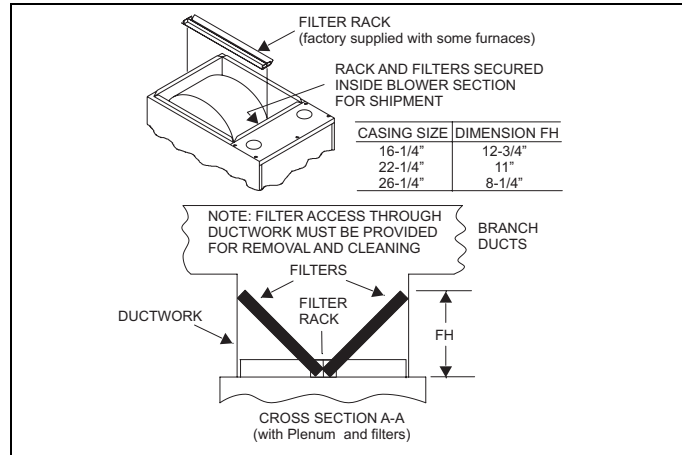
1. Measure the furnace width and use that measurement to determine the cabinet width.
  - A 14-1/2" wide cabinet is an "A" cabinet.
  - A 17-1/2" wide cabinet is an "B" cabinet.
  - A 21" wide cabinet is an "C" cabinet.
  - A 24-1/2" wide cabinet is an "D" cabinet.
2. Locate the cabinet size on Table 1 then determine whether you have a bottom or side return air duct using the following method.
  - a. If the return air filter is on the left or right side of the furnace it is a side return
  - b. If the air filter is on the bottom of the furnace then you have a bottom return.
  - c. If the air filters are on the bottom and the side of the furnace then you have a bottom and side return. You must replace both air filters. Table 1 will indicate 2 filters by using brackets with the number two (2).
  - d. If the air filters are on both sides of the furnace then you have a two sided return. You must replace both air filters. Table 1 will indicate 2 filters by using brackets with the number two (2).
3. After you determine the cabinet size and what return configuration you have, look up the recommended filter size from Table 1.

### Removing Filters

Most downflow furnaces have their filters located on the top of the furnace in an external filter rack. To check filters you should:

1. Follow the instructions to turn off the appliance before servicing.

2. Filters are installed in the return air plenum above the blower assembly. An "A" frame assembly supports the filters. Lift the filter slightly and remove for service.
3. Follow the instructions "HOW TO CLEAN YOUR FURNACE'S FILTER".
4. Reverse the procedure to reinstall filters.
5. Follow the operating instructions to place appliance in operation.



**FIGURE 6:** Filter Rack Assembly and Attachment

### Externally Mounted Air Filters

Some installations may have the air filter in a rack attached to the casing of the furnace or placed in the return air duct. You can gain access to the filter by pulling on the door or unscrewing the retaining screw, then slide the filter(s) out of its channel. Replace throw away filter(s) with the same size new filter(s). Throw away filter(s) may be replaced with cleanable filter(s) at this time. Cleanable filter(s) may be cleaned as described in the manufacturer instructions or as described below and then re-installed.

### How to Clean your Filter

High-velocity filters may be cleaned with a vacuum cleaner or washed with a garden hose. Be sure to shake off excess water and allow filter to completely dry before re-installing the filter.

To replace the filter after cleaning you must do the following:

1. Slide filter into place.
2. Snap the door on or place the door in position and tighten the retaining screws, if provided.
3. Make sure the door is secure to the end of the filter rack.
4. For filter grilles, place the filter into the grilles, close the grille cover and tighten the retaining screw.

Every time the filters are changed the following items should be visually inspected:

- Check combustion air and vent pipe for blockage or leakage.
- Check all components to be sure they are in good condition and that there are no obvious signs of deterioration.
- Check the drain lines to make sure there are no cracks or leaks.
- Check for dirt or lint on any surfaces or on components. Do not try to clean any of the surfaces or components. Cleaning of the furnace and its components must be done by a qualified service professional.

If, during the inspection of your furnace, you find any of the following conditions:

- Excessive amounts of dust and lint on components.
- Damaged or deteriorated components or surfaces.
- Leaks or blockage in the vent pipe passages.
- Water on any surface inside or outside of the furnace.



Do not operate the furnace. Call a certified dealer / qualified service agency to check and / or clean your furnace, or for more information if you have questions about the operation of your furnace.

If all components appear to be in good operating condition, replace the front panels. Turn ON the gas and electrical power supplies to the furnace, and set thermostat to the desired temperature.

### Motor Lubrication

The motors in these furnaces are permanently lubricated, and do not require periodic oiling.

**TABLE 1: Filter Sizes**

Input / Output BTU/H (kW)	CFM (m <sup>3</sup> /min)	Cabinet Size	Top Return Filter in(cm)
60/55 (17.57/16.10)	1200 (34)	B	(2) 14 x 20 (36 x 51)
80/75 (23.42/21.96)	1200 (34)	B	(2) 14 x 20 (36 x 51)
80/75 (23.42/21.96)	1600 (45)	C	(2) 14 x 20 (36 x 51)
100/95 (29.28/27.82)	1600 (45)	C	(2) 14 x 20 (36 x 51)
100/95 (29.28/27.82)	2000 (57)	C	(2) 20 x 20 (51 x 51)
120/112 (35.14/32.80)	2000 (57)	D	(2) 20 x 20 (51 x 51)

## SECTION II: SERVICE AND MAINTENANCE MANUAL

### SAFETY SECTION

The following safety rules must be followed when servicing the furnace.

### WARNING

#### **ELECTRIC SHOCK, FIRE OR EXPLOSION HAZARD**

*Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage.*

*Improper servicing could result in dangerous operation, serious injury, and death or property damage.*

- Before servicing, disconnect all electrical power to the furnace.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Verify proper operation after servicing.

### FURNACE MAINTENANCE SECTION

The furnace should be cleaned and adjusted by a certified dealer or qualified service contractor once a year or before the start of every heating season. The following items must be cleaned and serviced or replaced if there are signs of deterioration.

1. The vent terminal screen (if applicable).
2. The furnace vent and combustion air intake passageways. Should it be necessary to service the vent/air intake system, the manufacturer recommends this service be conducted by a qualified service agency. The operation of this appliance requires the reassembly and resealing of the vent/air intake system.
3. The furnace burners, ignitor and flame sensor.
4. The condensate collection and disposal system. If any disassembly of components containing flue or vent gases is required, a qualified service agency must perform the service.

### SEQUENCE OF OPERATION

The following describes the sequence of operation of the furnace. Refer to Figure 1 for component location.

#### Continuous Blower

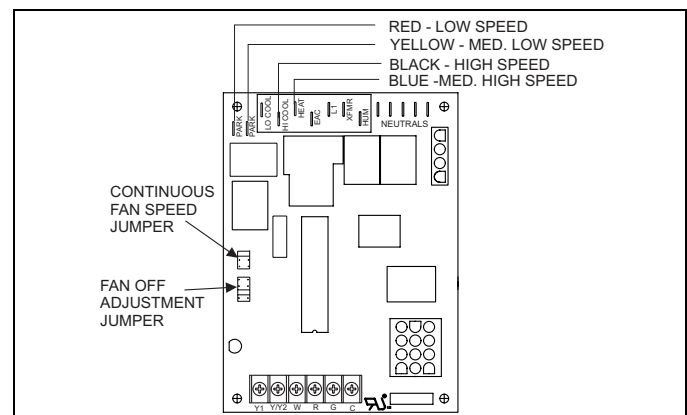
Cooling/heating thermostats have a fan switch that has an ON and AUTO position. In the ON position the thermostat circuit is completed between terminals R and G. The motor will operate on the speed tap selected on the Continuous Fan Speed Jumper on the control board (HI COOL, LO COOL, or HEAT pins).

### Intermittent Blower - Cooling

Cooling/heating thermostats have a fan switch that has an ON and AUTO position. In the AUTO position the thermostat circuit is completed between terminals R and G when there is a call for cooling. The motor will operate on the speed tap wire that is connected to the HI COOL terminal on the control board. When used with two-stage cooling units, the motor will operate on the speed tap connected to the LO COOL terminal when first stage cooling is operating. The motor will operate on the speed tap connected to the HI COOL terminal when second stage cooling is operating. The fan off setting is fixed at 60 seconds for SEER enhancement.

### Heating Cycle

When the thermostat switch is set on HEAT and the fan is set on AUTO, and there is a call for heat, a circuit is completed between terminals R and W of the thermostat. When the proper amount of combustion air is being provided, the pressure switch will close, the ignition control provides a 17-second warm-up period, the gas valve then opens, the gas starts to flow, ignition occurs and the flame sensor begins its sensing function. The blower motor will energize 30 seconds after the gas valve opens, if a flame is detected. Normal furnace operation will continue until the thermostat circuit between R and W is opened, which causes the ignition system and gas valve to de-energize and the burner flames to be extinguished. The vent motor will operate for 15 seconds and the blower motor will operate for the amount of time set by the fan-off delay jumper located on the control board. See Figure 7. The heating cycle is complete, and ready for the start of the next heating cycle.



**FIGURE 7: Typical Heat/Cool Speed Tap Connections**

If the flame is not detected within 2 seconds of the gas valve opening, the gas valve is shut off and a retry operation begins. If the flame is lost for 2 seconds during the 10-second stabilization period, the gas valve is shut off and a retry operation begins. During a retry operation, the vent motor starts a 15 second inter-purge and the ignitor warm-up time is extended to 27 seconds. If the flame is established for more than 10 seconds after ignition during a retry, the control will clear the ignition attempt (retry) counter. If three retries occur during a call for heat, the furnace will shut down for one hour. If at the end of the one hour shut down there is a call for heat, the furnace will initiate a normal start cycle. If the problem has not been corrected the furnace will again lockout after three retries.

A momentary loss of gas supply, flame blowout, or a faulty flame probe circuit will result in a disruption in the flame and be sensed within 1 second. The gas valve will de-energize and the control will begin a recycle operation. A normal ignition sequence will begin after a 15 second inter-purge. If during the five recycles the gas supply does not return, or the fault condition is not corrected the ignition control will lockout for one hour.

During burner operation, a momentary loss of power for 50 milliseconds or longer will de-energize the gas valve. When the power is restored, the gas valve will remain de-energized and the ignition sequence will immediately restart.

## Hot Surface Ignition System

### **⚠ WARNING**

#### **HOT SURFACE IGNITION SYSTEM**

*Do not attempt to light this furnace by hand (with a match or any other means). There may be a potential shock hazard from the components of the hot surface ignition system. The furnace can only be lit automatically by its hot surface ignition system.*

## FURNACE CLEANING SECTION

**NOTE:** The cleaning operations listed below must be performed only by a qualified service agency.

### **⚠ CAUTION**

*Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.*

### Burner Removal/Cleaning

The main burners should be checked periodically for dirt accumulation. If cleaning is required, follow this procedure:

1. Turn off the electrical power to the unit.
2. Turn off the gas supply at the external manual shut-off valve and loosen the ground union joint.
3. Remove the upper access panel and remove the burner box cover.
4. Disconnect wires from flame sensor, rollout switch and HSI igniter. Remove igniter carefully, as it is easily broken.
5. Remove the screws that hold the burner box assembly to the vest panel and remove the assembly.
6. Remove burners from the burner assembly.
7. Burners may be cleaned by rinsing in hot water.
8. Reassemble the burners in the reverse order.

### Cleaning the Heat Exchanger

1. Turn off the electrical power to the unit.
2. Turn off the gas supply at the external manual shut-off valve and loosen the ground union joint.
3. Remove the upper access panel and remove the burner box cover.
4. Disconnect wires from flame sensor, rollout switch and HSI igniter. Remove igniter carefully, as it is easily broken.
5. Remove the screws that hold the burner box assembly to the vest panel and remove the assembly.
6. Remove the vent pipe assembly, vent blower and condensate pan.
7. The heat exchanger is now exposed.
8. With a long flexible wire brush, clean inside each tube at both the top and bottom. The brush must pass around the rear heat exchanger tubes. Then vacuum loose the scale and dirt from each tube.
9. Replace all components in reverse order. Reconnect all wiring.
10. Restore electrical power and gas supply to the furnace.
11. Check furnace operation.

### Cleaning the Secondary Heat Exchanger

1. Follow steps 1 - 7 under cleaning the Heat Exchanger.
2. Remove the vent piping from the vent blower housing. Disconnect the drain lines from the vent blower housing and from the condensate drain pan. Remove the vent blower housing blower and the condensate pan.
3. Using a stiff wire brush, remove the loose scale or soot from each tube.

4. Vacuum the secondary heat exchanger.
5. Finish the cleaning procedure by following steps 9 - 11 under cleaning the Heat Exchanger.

### Cleaning the Vent / Air Intake System

Should it be necessary to service the vent / air intake system, the manufacturer recommends this service be conducted by a qualified service agency.

The operation of this appliance requires the reassembly and resealing of the vent / air intake system as specified in the “**Combustion Air and Vent System**” located in the Installation Manual.

## TROUBLESHOOTING

The following visual checks should be made before troubleshooting:

1. Check to see that the power to the furnace and the ignition control module is ON.
2. The manual shut-off valves in the gas line to the furnace must be open.
3. Make sure all wiring connections are secure.
4. Review the sequence of operation. Start the system by setting the thermostat above the room temperature. Observe the system's response. Then use the troubleshooting section in this manual to check the system's operation.

### **⚠ WARNING**

*Never bypass pressure switch to allow furnace operation. To do so will allow furnace to operate under potentially hazardous conditions.*

*Do not try to repair controls. Replace defective controls with UPG Source 1 Parts.*

*Never adjust pressure switch to allow furnace operation.*

## FURNACE CONTROL DIAGNOSTICS

The furnace has built-in, self-diagnostic capability. If a system problem occurs, a blinking LED shows a fault code. The LED can flash red, green or amber to indicate various conditions. It is located behind a clear view port in the blower compartment door.

The control continuously monitors its own operation and the operation of the system. If a failure occurs, the LED will indicate the failure code. If the failure is internal to the control, the light will stay on continuously. In this case, the entire control should be replaced, as the control is not field repairable.

Flash sequence codes 1 through 11 are as follows: LED will turn “on” for 1/4 second and “off” for 1/4 second. This pattern will be repeated the number of times equal to the code. For example, six “on” flashes equals a number 6 fault code. All flash code sequences are broken by a 2 second “off” period.

**SLOW GREEN FLASH:** Normal operation.

**SLOW AMBER FLASH:** Normal operation with call for heat.

**RAPID RED FLASH:** Twinning error, incorrect 24V phasing. Check twinning wiring.

**RAPID AMBER FLASH:** Flame sense current is below 1.5 microamps. Check and clean flame sensor. Check for proper gas flow. Verify that voltage is greater than 1.5 VDC at flame current test pad.

**1 RED FLASH:** This indicates that flame was sensed when there was not a call for heat. With this fault code the control will turn on both the inducer motor and supply air blower. A gas valve that leaks through or is slow closing would typically cause this fault.

**2 RED FLASHES:** This indicates that the normally open pressure switch contacts are stuck in the closed position. The control confirms these contacts are open at the beginning of each heat cycle. This would indicate a faulty pressure switch or miswiring.

**3 RED FLASHES:** This indicates the normally open pressure switch contact did not close after the inducer was energized. This could be caused by a number of problems: faulty inducer, blocked vent pipe, broken pressure switch hose or faulty pressure switch.

**4 RED FLASHES:** This indicates that a primary or auxiliary limit switch has opened its normally closed contacts. With this fault code the control will operate the supply air blower and inducer. This condition may be caused by: dirty filter, improperly sized duct system, incorrect blower speed setting, incorrect firing rate or faulty blower motor.

**5 RED FLASHES:** This fault is indicated if the normally closed contacts in the rollout switch opens. The rollout control is manually reset. If it has opened, check for proper combustion air, proper inducer operation, and primary heat exchanger failure or burner problem. Be sure to reset the switch and cycle power (24 VAC) to the control after correcting the failure condition.

**6 RED FLASHES:** This indicates that after the unit was operating, the pressure switch opened 4 times during the call for heat. If the main blower is in a "Delay on" mode it will complete it, and any subsequent delay off period. The furnace will lock out for one hour and then restart.

**7 RED FLASHES:** This fault code indicates that the flame could not be established. This no-light condition occurred 3 times (2 retries) during the call for heat before locking out. Low gas pressure, faulty gas valve, dirty or faulty flame sensor, faulty hot surface ignitor or burner problem may cause this. The furnace will lock out for one hour and then restart.

**8 RED FLASHES:** This fault is indicated if the flame is lost 5 times (4 recycles) during the heating cycle. This could be caused by low gas pressure, dirty or faulty flame sensor or faulty gas valve. The furnace will lock out for one hour and then restart.

**9 RED FLASHES:** Indicates a grounding problem or reversed line voltage polarity. Both heating and cooling operations will be affected. Check polarity at furnace and branch. Check furnace grounding including the transformer ground.

**10 RED FLASHES:** Gas flow with no call for heat. Check gas valve and gas valve wiring.

**11 RED FLASHES:** This indicates that a primary or auxiliary limit switch has opened its normally-closed contacts and has remained open for more than five minutes. This condition is usually caused by a failed blower motor or blower wheel. Cycle power (24 VAC) to the control to reset the hard lockout condition after correcting the failure condition.

**STEADY ON RED:** Control failure. Replace control board.

**60-MINUTE AUTOMATIC RESET FROM LOCKOUT:** This control includes a "watchdog" type circuit that will reset from a lockout condition after 60 minutes. Operational faults 6,7,8 will be reset. This provides protection to an unoccupied structure if a temporary condition exists causing a furnace malfunction. An example would be a low incoming gas supply pressure preventing unit operation. When the gas pressure is restored, at some point the "watchdog" would restart the unit and provide heat for the house.

**NOTE:** If a flame is detected the control flashes the LED for 1/8 of a second and then enters a flame stabilization period.

IGNITION CONTROL (P/N 031-01973-000)  
Normal flame sense current is approximately  
3.7 microamps DC ( $\mu$ A)  
Low flame signal warning starts at 1.5 microamps.  
Low flame signal control lockout point is  
0.9 microamps DC ( $\mu$ A)

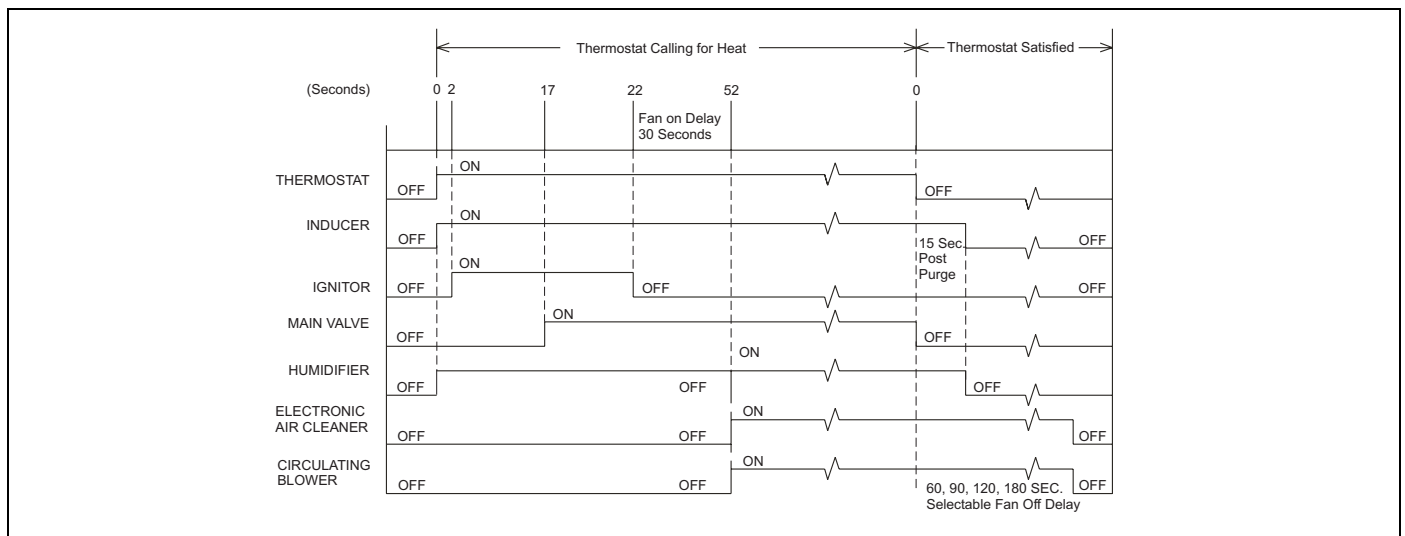
## DIAGNOSTIC FAULT CODE STORAGE AND RETRIEVAL

The control in this furnace is equipped with memory that will store up to five error codes to allow a service technician to diagnose problems more easily. This memory will be retained even is power to the furnace is lost. **This feature should only be used by a qualified service technician.**

The control stores up to five separate error codes. If more than five error codes have occurred since the last reset, only the five most recent will be retained. The furnace control board has a button, labeled "LAST ERROR" that is used to retrieve error codes. This function will only work if there are no active thermostat signals. So any call for heating, cooling or continuous fan must be terminated before attempting to retrieve error codes.

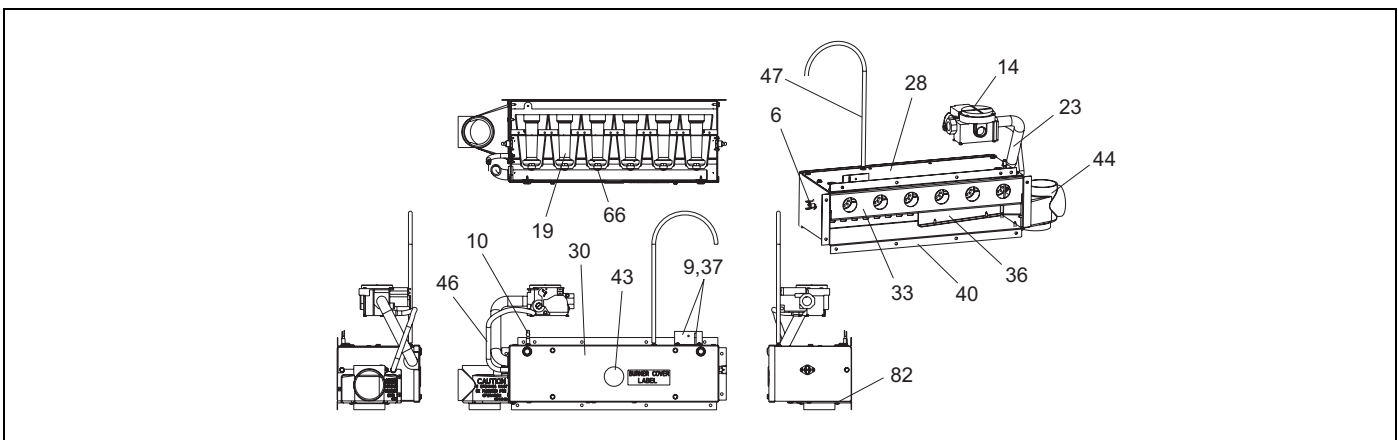
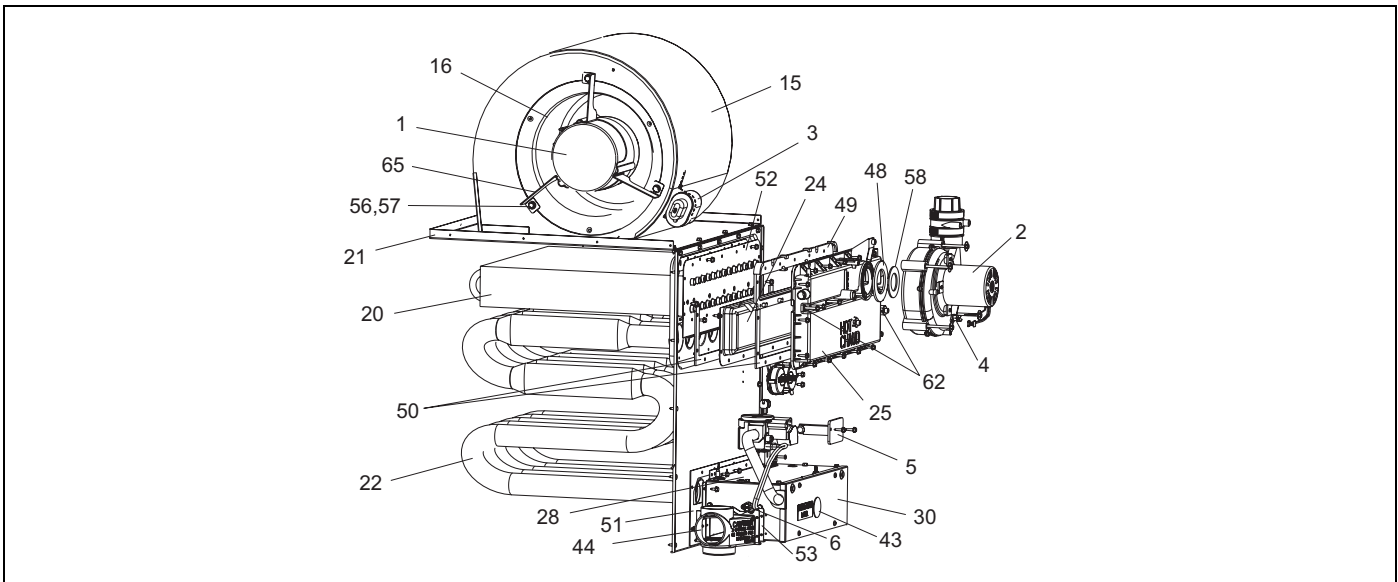
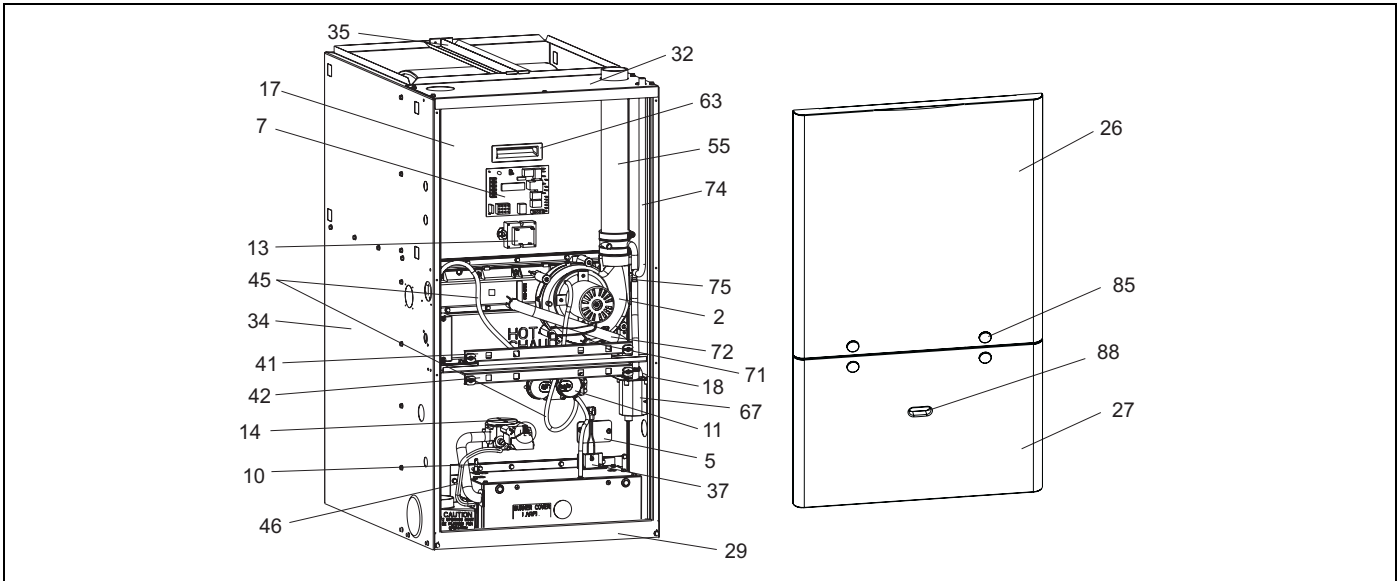
To retrieve the error codes, push the LAST ERROR button. The LED on the control will then flash the error codes that are in memory, starting with the most recent. There will be a two-second pause between each flash code. After the error codes have all been displayed, the LED will resume the normal slow green flash after a five second pause. To repeat the series of error codes, push the button again.

If there are no error codes in memory, the LED will flash two green flashes. To clear the memory, push the LAST ERROR button and hold it for more than five seconds. The LED will flash three green flashes when the memory has been cleared, then will resume the normal slow green flash after a five-second pause.



**FIGURE 8:** Furnace Control Event Schedule

## SECTION III: REPLACEMENT PARTS LIST





ITEM	DESCRIPTION
<b>MOTOR</b>	
1	MOTOR, DIRECT DRIVE BLOWER
2	MOTOR, INDUCER ASS'Y
<b>ELECTRICAL</b>	
3	CAPACITOR, RUN
4	SWITCH, LIMIT (INDUCER)
5	LIMIT, TEMPERATURE (Primary)
6	LIMIT, FLAME ROLL-OUT
7	CONTROL, FURNACE MODULE
8	FUSE
9	IGNITER
10	SENSOR, FLAME
11	SWITCH, PRESSURE
12	SWITCH, DOOR
13	TRANSFORMER
14	VALVE, GAS
<b>AIR MOVING</b>	
15	HOUSING, BLOWER
16	WHEEL, BLOWER
<b>FABRICATED PARTS</b>	
18	BRACKET, CONDENSATE TRAP
19	BURNER, MAIN GAS
20	COIL, CONDENSING
21	SHELF, BLOWER
22	HEAT EXCHANGER ASS'Y
23	MANIFOLD, GAS
24	SHIELD, PAN
25	PAN, CONDENSATE
26	PANEL, VEST ACCESS
27	PANEL, BLOWER ACCESS
28	WRAPPER, BURNER BOX
29	CHANNEL, TOE PLATE
30	COVER, GAS CONTROL
31	PANEL, BOTTOM
32	PANEL, TOP
33	SUPPORT, BURNER
34	WRAPPER, CABINET
35	BRACKET, FILTER
36	PLATE, DIFFUSER
37	BRACKET, IGNITER
38	BRACKET, DOOR SWITCH
39	BRACKET, DOOR
40	BOTTOM PANEL, BURNER BOX
41	TOP MOUNTING BRACKET
42	BOTTOM MOUNTING BRACKET

**MISCELLANEOUS**

ITEM	DESCRIPTION
43	PLUG, WINDOW, CLEAR - 1.5"
44	COMBUSTION AIR TRANSITION, 3-WAY
45	TUBING, SILICONE (Gray, .188 ID, 2.83 ft. req'd)
46	TUBING, SILICONE (Preformed)
47	TUBING, SILICONE (Gray, .188 ID, 1.25 ft. req'd)
48	GASKET, COMBUSTION BLOWER
49	GASKET, CONDENSATE PAN
50	GASKET, UPPER CONDENSATE PAN (2 Req'd)
51	GASKET, GAS CONTROLS
52	GASKET, CONDENSING COIL
53	GASKET, COMBUSTION AIR TRANSITION
54	
55	VENT PIPE 2" X 15.25" LG.
56	GROMMET, MOTOR (3 Req'd)
57	FERRULE (3 Req'd)
58	COMBUSTION BLWR RESTRICTOR
59	SPRING, DOOR
60	RETAINER, SQUARE
61	RESTRICTOR, TUBE
62	WASHER, FLAT FIBERGLASS (2 Req'd)
63	HANDLE, DOOR
64	HARNESS, MAIN WIRING
65	MOUNT, 1 PC. MOTOR
66	ORIFICE, BURNER (Natural #45)
67	TRAP, CONDENSATE
68	WIRING DIAGRAM
69	45 DEG. STREET ELBOW 2"
70	DRAIN TUBE, CONDENSATE TRAP
71	DRAIN TUBE, COMBUSTION BLOWER
72	DRAIN TUBE, CONDENSATE PAN
73	DRAIN TUBE, STRAIGHT 21" LG.
74	DRAIN TUBE, RAIN GUTTER
75	DRAIN HOSE ASSEMBLY
76	DRAIN TUBE, CONDENSATE
77	LOCKNUT, CONDUIT (1/2")
78	ADAPTER, INSERT
79	BUSHING, THREADED
80	FILTER, AIR (2 Req'd) (20 x 14 x .75)
81	BAFFLE, BURNER BOX
82	GROMMET, MANIFOLD
83	
84	DRAIN TUBE, VENT PIPE
85	DOOR KNOB (Black)
86	RETAINER, DOOR KNOB
87	NUT, SELF-THREADING
88	SIGHT GLASS, OVAL

NOTE: \*Not Shown

Major components and suggested stocking items are shown with shaded item number.



**FIELD INSTALLED ACCESSORIES - NON-ELECTRICAL**

<b>MODEL NO.</b>	<b>DESCRIPTION</b>	<b>USED WITH</b>
1NP0347	PROPANE (LP) CONVERSION KIT	ALL MODELS
1CT0302	CONCENTRIC INTAKE/VENT 2"	60, 80, 100 INPUT MBH
1CT0303	CONCENTRIC INTAKE/VENT 3"	120 INPUT MBH
1PS0901	HIGH ALTITUDE PRESSURE SWITCH KIT (Does Not Include Orifices)	FOR APPLICATION INFORMATION SEE FORM 035-14447-000
1PS0902		
1PS0903		
1NK0301	CONDENSATE NEUTRALIZER KIT	ALL MODELS
1TK0917 1TK0921 1TK0924	TRANSITION KITS FOR COIL MOUNTING	17 1/2" CABINETS 21" CABINETS 24 1/2" CABINETS

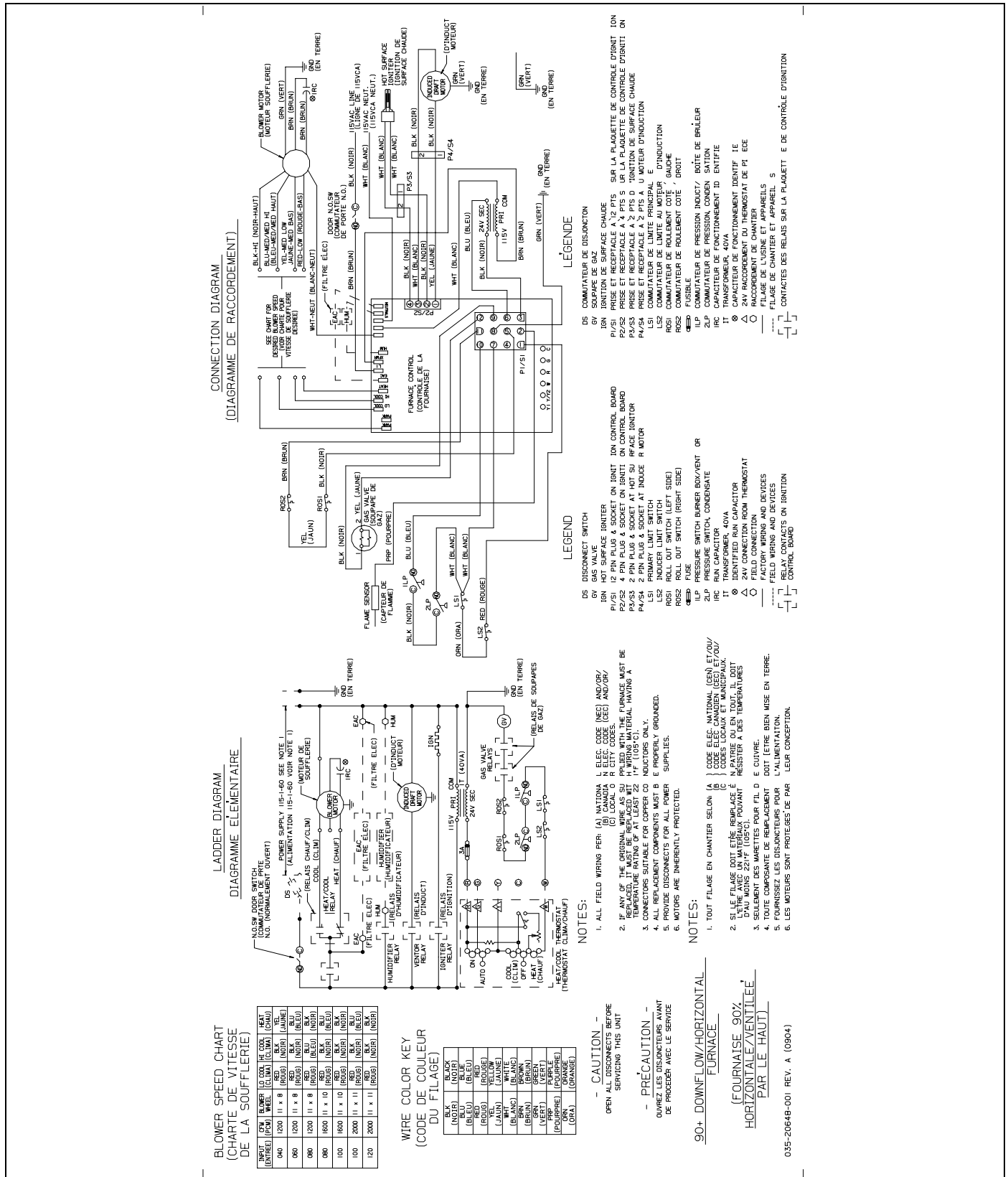
**REPLACEMENT PART CONTACT INFORMATION**

This is a generic parts list. To request a complete parts list, refer to the contact information below:

- Visit our website at [www.source1parts.com](http://www.source1parts.com) for the following information:
  1. Search for a part or browse the catalog.
  2. Find a dealer or distributor.
  3. Customer Service contact information.
    - a. Click on the "Brand Links" button
    - b. Click on the "Customer Service" button
- You can contact us by mail. Just send a written request to:

**York International  
Consumer Relations  
5005 York Drive  
Norman, OK 73069**

## SECTION IV: WIRING DIAGRAM



**FIGURE 9: Wiring Diagram**

# Limited Warranty

UPG warrants this product to be free from defects in factory workmanship and material under normal use and service and will, at its option, repair or replace any parts that prove to have such defects according to the terms outlined on this warranty. This warranty covers only the equipment described by the Product Model Number and Serial Number listed on the Warranty Registration Card.

UPG warrants the primary heat exchangers in the product to be free from defects in factory workmanship and material under normal use and service and will at its option, repair or furnish a replacement heat exchanger, either new or reconditioned, that meets the intended fit, use and function of the original heat exchanger for any heat exchanger furnished by UPG which proves to have such defects within the duration of warranty coverage. Alternatively, UPG may, at its option, extend a replacement allowance to be applied toward the purchase of a new furnace or packaged unit marketed by UPG. The exact amount of the allowance will be determined at the discretion of UPG, based upon current market conditions, but in no case shall this allowance exceed thirty (30) percent of the original consumer purchase price of the furnace, excluding such items as ductwork, wiring, piping and installation costs. UPG shall have no responsibility hereunder for installation, shipping, handling or other charges except as specifically provided herein.

For your benefit and protection, return the Warranty Registration Card to UPG promptly after installation. This will initiate the warranty period and allow us to contact you, should it become necessary. In the absence of a recorded Warranty Registration Card, the warranty period will begin upon product shipment from UPG.

This warranty extends only to the original consumer purchaser and is non-transferable. For this warranty to apply, the product must be installed according to UPG recommendations and specifications, and in accordance with all local, state, and national codes; and the product must not be removed from its place of original installation. The warranty period for repair or replacement parts provided hereunder shall not extend beyond the warranty period stated on the reverse side of this warranty

FURNACE TYPE		HEAT EXCHANGER		PARTS
		Residential Applications	Non-Residential Applications	
		Original Owner		
90%	PS9 / FC9S / FL9S	Lifetime	10	5

UPG strongly recommends regular periodic preventative maintenance on this equipment. The person most familiar with the equipment in your HVAC system is a UPG dealer. The UPG dealer can ensure your maintenance program meets the conditions of the "UPG Warranty", maximize the efficiency of the equipment, and service your unit within the mandated guidelines with regard to unlawful discharge of refrigerants into the atmosphere.

This warranty applies only to products installed in the United States and Canada.

## EXCLUSIONS

This warranty does not cover any:

1. Shipping, labor, or material charges.
2. Damages resulting from transportation, installation, or servicing.
3. Damages resulting from accident, abuse, fire, flood, alteration, or acts of God (tampering, altering, defacing or removing the product serial number will serve to void this warranty).
4. Damages resulting from use of the product in a corrosive atmosphere.
5. Damages resulting from inadequacy or interruption of electrical service or fuel supply, improper voltage conditions, blown fuses, or other like damages.
6. Cleaning or replacement of filters.
7. Damages resulting from failure to properly and regularly clean air and/or water side of condenser and evaporator.
8. Damages resulting from: (I) freezing of condenser water or condensate; (II) inadequate or interrupted water supply; (III) use of corrosive water; (IV) fouling or restriction of the water circuit by foreign material or like causes.
9. Damages resulting from operation with inadequate supply of air or water.
10. Damages resulting from use of components or accessories not approved by UPG (vent dampers, etc.).
11. Increase in fuel or electric cost.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

SOME STATES DO NOT ALLOW THE DISCLAIMER OF IMPLIED WARRANTY, SO THAT THE ABOVE DISCLAIMER MAY NOT APPLY TO YOU.

SOME STATES ALLOW ONLY A PARTIAL LIMITATION ON IMPLIED WARRANTIES TO LIMIT THE DURATION OF IMPLIED WARRANTIES TO THE DURATION OF THE EXPRESS WARRANTY. IN SUCH STATES, THE DURATION OF IMPLIED WARRANTIES IS HEREBY EXPRESSLY LIMITED TO THE DURATION OF THE EXPRESS WARRANTY ON THE FACE HEREOF.

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF WARRANTY OR CONTRACT, TORT (INCLUDING NEGLIGENCE) STRICT LIABILITY OR OTHERWISE, SHALL UPG BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF USE OF THE EQUIPMENT OR ASSOCIATED EQUIPMENT, LOST REVENUES OR PROFITS, COST OF SUBSTITUTE EQUIPMENT OR COST OF FUEL OR ELECTRICITY. THE ABOVE LIMITATIONS SHALL INURE TO THE BENEFIT OF UPG'S SUPPLIERS AND SUBCONTRACTORS. THE ABOVE LIMITATION ON CONSEQUENTIAL DAMAGES SHALL NOT APPLY TO INJURIES TO PERSONS IN THE CASE OF CONSUMER GOODS.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, OR FOR STRICT LIABILITY IN TORT, SO THAT THE ABOVE EXCLUSIONS AND LIMITATIONS MAY NOT APPLY TO YOU.

UPG DOES NOT ASSUME, OR AUTHORIZE ANY OTHER PERSON TO ASSUME FOR UPG, ANY OTHER LIABILITY FOR THE SALE OF THIS PRODUCT. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

For Owner's Information:

PRODUCT MODEL NO. \_\_\_\_\_ INSTALLATION DATE \_\_\_\_\_  
UNIT SERIAL NO. \_\_\_\_\_ INSTALLING DEALER \_\_\_\_\_